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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR  | ATTORNEY DOCKET NO.          | CONFIRMATION NO.       |
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| 10/564,605   | 06/27/2006  | Stephen Rhys Graville | M03B180                      | 8876                   |
| 20411  | 7590        | 06/19/2008            |                              |                        |
| The BOC Group, Inc.<br>575 MOUNTAIN AVENUE<br>MURRAY HILL, NJ 07974-2082 |             |                       | EXAMINER<br>VANOT, TIMOTHY C |                        |
|  |             |                       | ART UNIT<br>1793             | PAPER NUMBER           |
|  |             |                       | MAIL DATE<br>06/19/2008      | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/564,605

**Applicant(s)**

GRAVILLE, STEPHEN RHYS

**Examiner**

TIMOTHY C. VANOS

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-17 is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 1, 4, 10 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Paper No(s)/Mail Date \_\_\_\_\_
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract **not exceed 150 words in length** since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

*In this application, the abstract exceeds 150 words in length and is (therefore) too long.*

### ***Claim Objections***

a) In claim 1 steps a) and d), claim 4, claim 10 and claim 13, the word "Claus" is misspelled.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a) In claim 1 step g), the reference to an "upstream" (catalytic reaction of hydrogen sulfide to form further sulphur vapour?) is confusing because none of the previous steps before step g) mention this "upstream" catalytic reaction of hydrogen sulfide.
- b) In claim 1 step I), the claim language does not set forth the metes and bounds of the "desired minimum percentage conversion of hydrogen sulphide".

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.

S. Pat. 4,798,716 to Palm in view of US 2002/0021993 A1 to Watson et al.

Claim 1 in the Palm patent describes a process for the recovery of sulfur from a gas stream comprising hydrogen sulfide, comprising:

introducing a thermal reaction mixture comprising the hydrogen sulfide-containing gas and an oxygen-enriched stream of air (or pure oxygen) into the combustion zone of a Claus furnace;

combusting the thermal reaction mixture in the Claus furnace to produce a combustion exhaust gas comprising hydrogen sulfide, sulfur dioxide, carbon dioxide, water and elemental sulfur;

introducing the combustion exhaust gas into a Claus catalytic reactor;

subjecting the combustion exhaust gas to Claus reaction conditions in the presence of a catalyst to produce a Claus effluent gas stream comprising hydrogen sulfide, sulfur dioxide, carbon dioxide, water and elemental sulfur;

introducing the Claus effluent gas stream into a condensor to produce liquid sulfur (which is recovered) and a condensor effluent comprising hydrogen sulfide, sulfur dioxide, carbon dioxide and water;

converting all of the sulfur species in the condensor effluent into hydrogen sulfide, thereby forming a condensor effluent comprising hydrogen sulfide, carbon dioxide and water;

removing the water from the condenser effluent, and

moderating the temperature of the Claus furnace by returning at least a portion of the dried condenser effluent as a diluent stream to the combustion zone of the Claus furnace.

The difference between the Applicants' claims and this Palm patent is that the Palm patent does not describe the presence of ammonia in the feed gas entering the Claus plant (or the effect that the re-cycled dried condenser effluent gas would have on the ammonia), as set forth in Applicant's claim 1.

The abstract of US 2002/0021993 A1 to Watson makes it clear that ammonia is a routine and conventional contaminant in feed gases fed into a Claus plant.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made *to have further described* the process of the Palm patent by reciting the presence of ammonia in the feed gas entering the Claus plant and to also *further describe* what effect the water-depleted re-cycle stream will have on this ammonia, as set forth in Applicant's claim 1 steps (a) and (I), *because* the abstract of US 2002/0021993 A1 renders known and conventional that ammonia is a typical contaminant in a feed gas fed into a Claus plant and it is also obvious to merely describe what effect Palm's water-depleted re-cycle stream will have on this ammonia.

#### ***Allowable Subject Matter***

Applicant's claim 13 and the claims dependent thereon have not been rejected under either 35USC102 or 35USC103 because claim 13 is limited to introducing the water-depleted reducing gas flow into an intermediate region of the first catalytic stage,

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whereas claim 1 step (h) in U. S. Pat. 4,798,716 teaches the introduction of the water-depleted condenser effluent into a combustion zone of a Claus furnace.

***References Made of Record***

The following additional references are made of record:

US 2002/0025292 A1 disclosing the treatment of a gas stream containing hydrogen sulphide, and

U. S. Pat. 5,468,458 disclosing the treatment of hydrogen sulfide-containing gas streams.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY C. VANOY whose telephone number is (571)272-8158. The examiner can normally be reached on Mon-Fri 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner  
Art Unit 1793

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